

CLAIMS

What is claimed is:

1. A system for controlling a braking system of a vehicle that is moving toward an object, comprising:
 - a vehicle speed (VS) sensor;
 - a steering direction (SD) sensor;
 - 5 at least one sensor configured to provide a distance to the object (DTO);
 - a processor in operable communication with the braking system and configured to receive the VS, the SD and DTO, said processor further configured to:
 - 10 (i) determine a projected vehicle path (PVP) and a minimum stopping distance (MSD) for the vehicle based at least in part on the VS and the SD;
 - (ii) determine whether the object is in the PVP and whether the DTO is less than or equal a threshold distance (TD);
 - 15 (iii) determine a required deceleration (RD) for the braking system to substantially reduce the vehicle speed if the object is in the PVP and the DTO is less than or equal the threshold distance (TD); and
 - (iv) communicate the RD to the braking system.
2. The system of claim 1 wherein the threshold distance TD depends at least in part on MSD.
3. The system of claim 1 further comprising a brake pedal sensor coupled to the processor for determining a driver requested deceleration (DRD) for the vehicle.
4. The system of claim 3 wherein the processor compares DRD and RD and communicates said DRD to the braking system if said DRD is greater than said RD.

5. The system of claim 1 further comprising a first device coupled to the processor for determining whether a throttle request and a second device coupled to the processor for producing an engine power setting corresponding to the throttle request.

6. The system of claim 5 wherein the processor compares the engine power setting to a predetermined value and if the engine power setting exceeds the predetermined value, communicating a driver requested deceleration (DRD) to the braking system.

7. The system of claim 1 wherein the at least one sensor comprises a first sensor directed in a first direction of the vehicle and at least a second sensor directed in a second direction substantially opposite said first direction.

8. A method for controlling a braking system of a vehicle that is moving toward an object, the method comprising the steps of:

- measuring a vehicle speed (VS);
- measuring a steering direction (SD);
- 5 measuring a distance to the object (DTO);
- calculating a projected vehicle path (PVP) and minimum stopping distance (MSD) for the vehicle based at least in part on the VS and the SD;
- 10 determining whether the object is in the PVP and whether the DTO is less than or equal to a threshold distance (TD);
- calculating a required deceleration (RD) for the braking system to substantially reduce the vehicle speed if the object is in the PVP and the DTO is less than or equal to the TD; and
- communicating the RD to the braking system.

9. The method of claim 8 wherein the TD depends at least in part on the MSD.

10. The method of claim 8 further comprising the step of sensing a driver requested deceleration (DRD) for the vehicle.

11. The method of claim 10, further comprising the step of comparing the DRD and the RD and communicating the DRD to the braking system if the DRD is greater than the RD.

12. The method of claim 8 wherein $TD = k1 * MSD + k2$ and $k1$ and $k2$ are predetermines parameters of the vehicle.

13. The method of claim 8 wherein TD is determined at least in part based on VS.

14. The method of claim 8 further comprising the steps of:
determining a transmission gear position of the vehicle;
actuating rear sensors to determine the DTO if the transmission
5 gear position indicates a reverse direction of motion for the vehicle; and
actuating front sensors to determine the DTO if the transmission
gear position indicates a forward direction of motion for the vehicle.

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17. A system for controlling a braking system of a vehicle that is moving toward an object, comprising:

a first sensor configured to detect the object in a first direction of the vehicle and determine a distance to the object (DTO) if the object is in
5 said first direction;

a second sensor configured to detect the object in a second direction of the vehicle and determine the DTO if the object is in said second direction;

a steering sensor for determining a steering direction (SD);

- 10 a brake pedal sensor for determining a driver requested
deceleration (DRD) of the vehicle;
 a speed sensor for determining a vehicle speed (VS)
 a processor in operable communication with the braking system
and configured to receive the DTO, SD, DRD and VS, said processor
15 further configured to:
- (i) calculates a projected vehicle path (PVP) and minimum
stopping distance (MSD) based at least in part upon said VS and the SD;
 - (ii) determines whether the object is in PVP and whether the
20 DTO is less than or equal a threshold distance (TD) based at least in part on
the MSD;
 - (iii) calculates a required deceleration (RD) for the braking
system to substantially reduce the vehicle speed if the object is in the PVP
and the DTO is less than or equal to the threshold distance (TD);
 - (iv) compares the DRD and the RD and communicates the DRD
25 to the braking system if said DRD is greater than said RD; and
 - (iii) communicating the RD to the braking system if the DRD is
less than said RD.